1/13/99

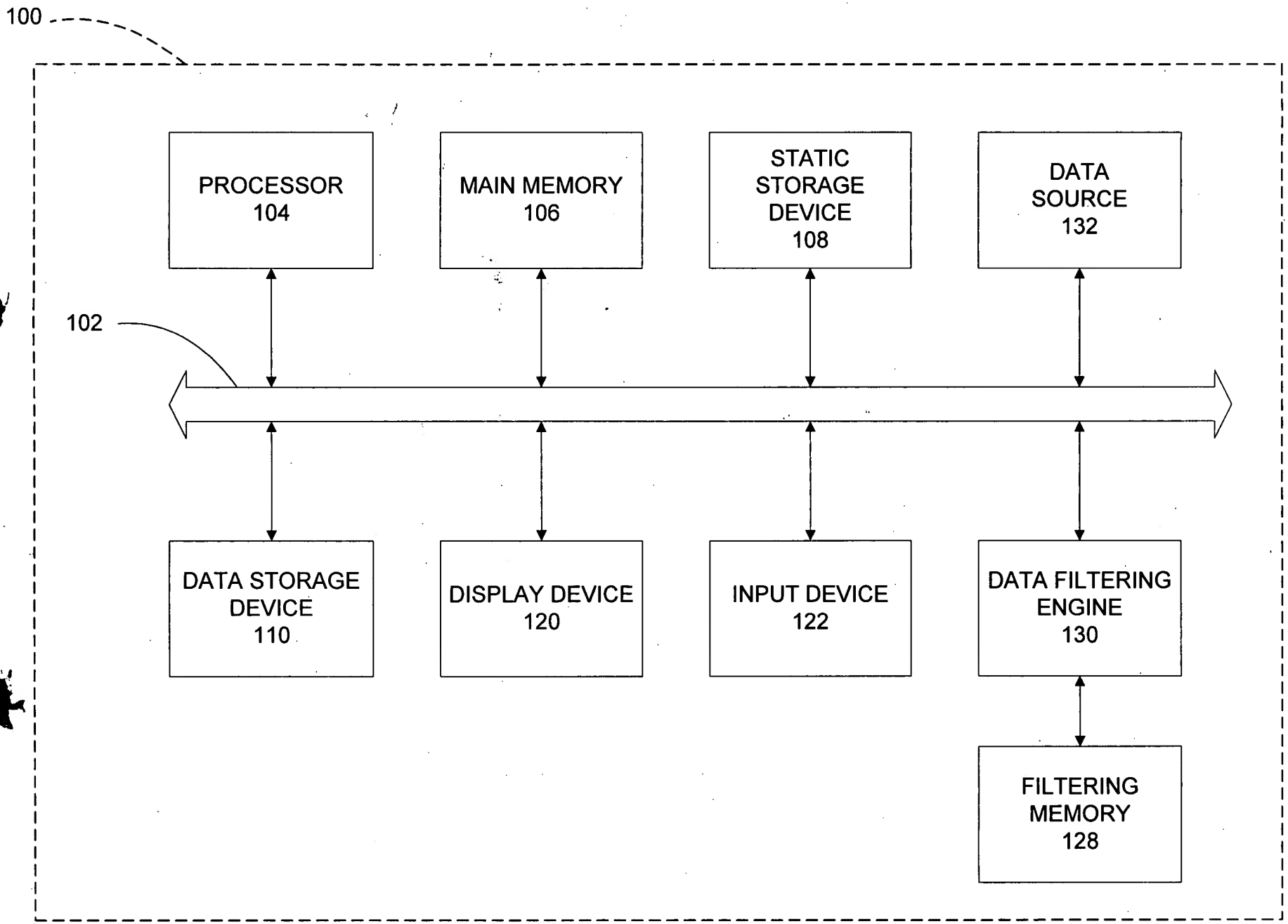


FIGURE 1

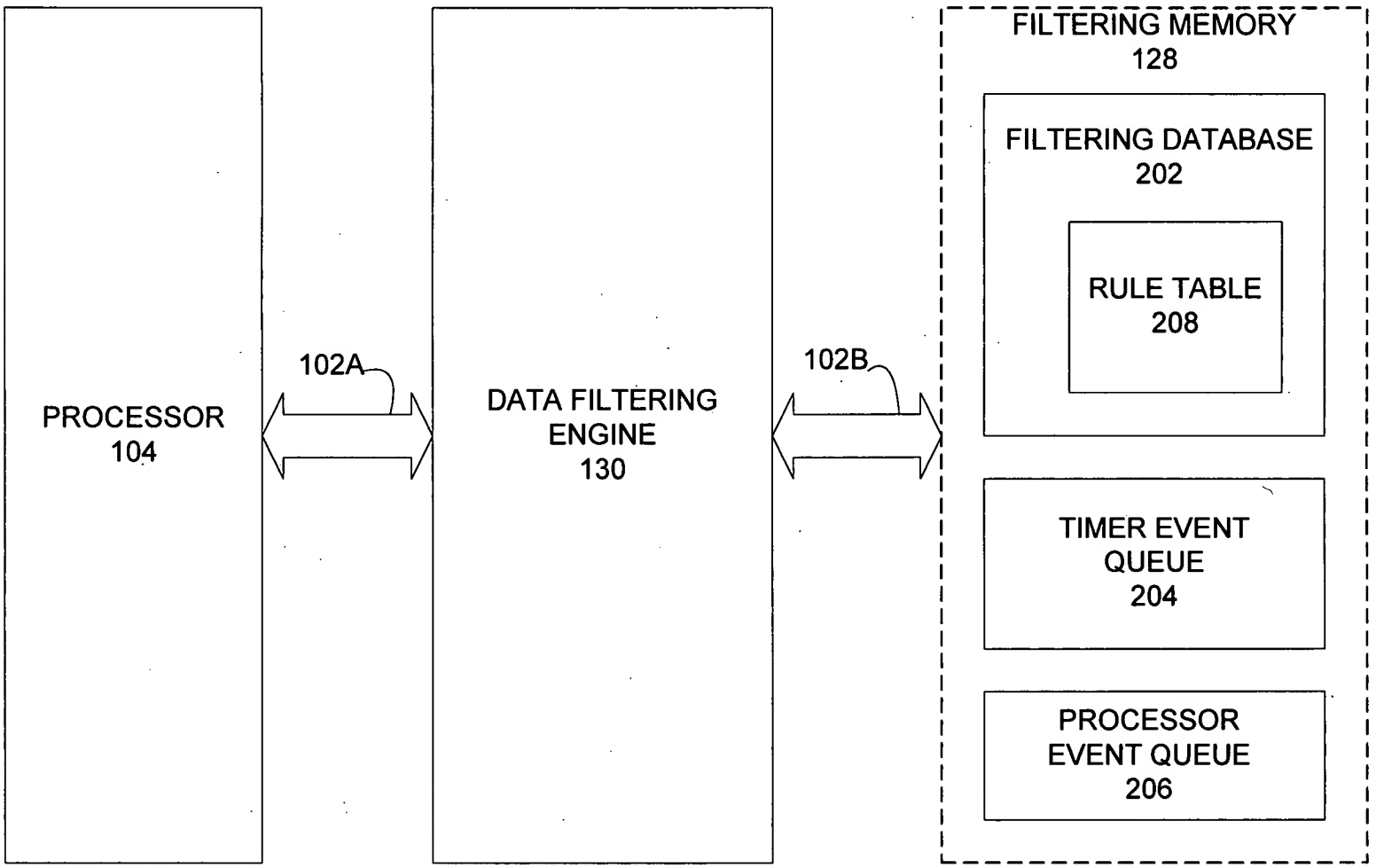


FIGURE 2

(SEQUENTIAL DATA FILTERING SYSTEM)

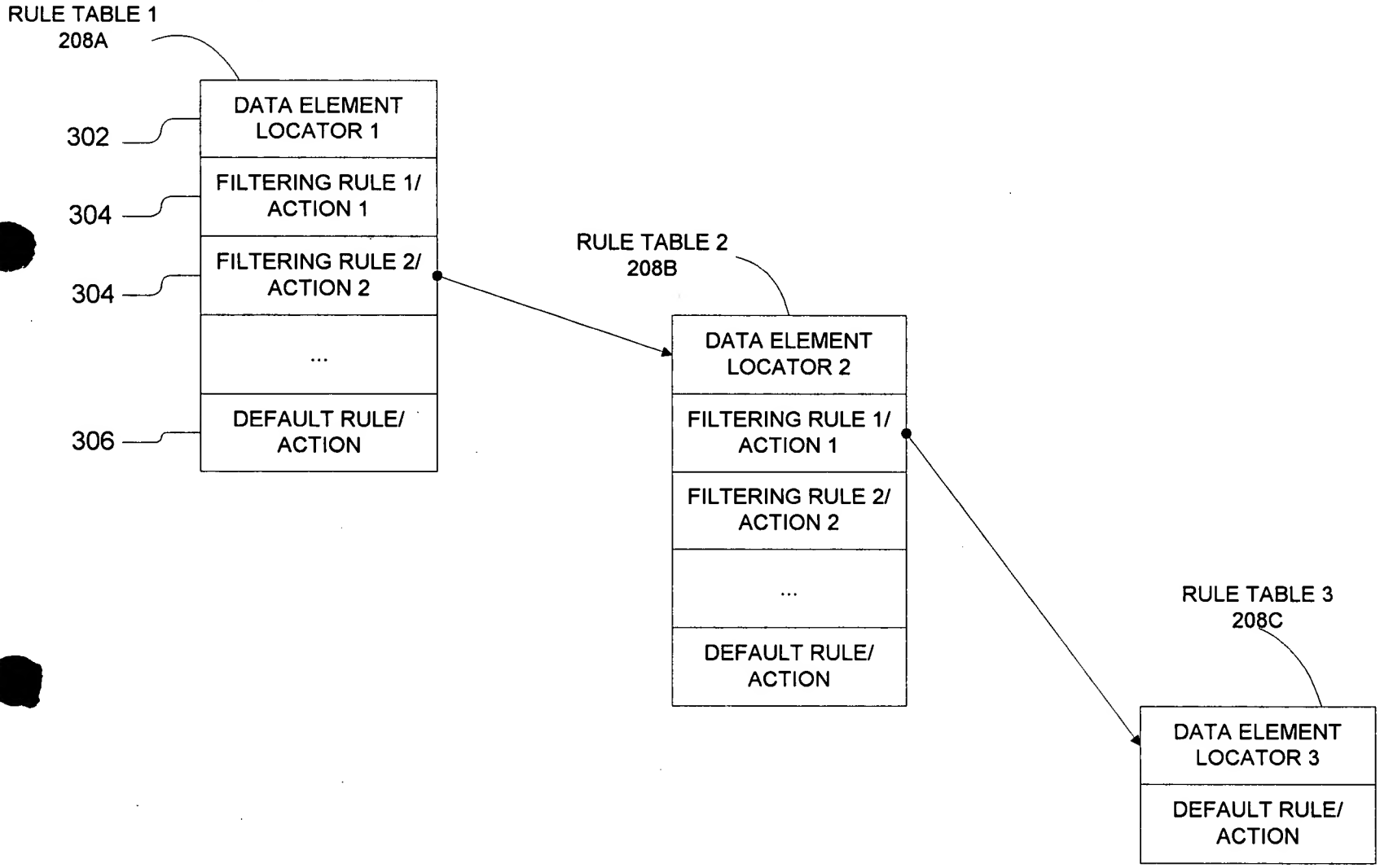


FIGURE 3

MULTI-WAY DECISION TREE AS LINKED RULE TABLES

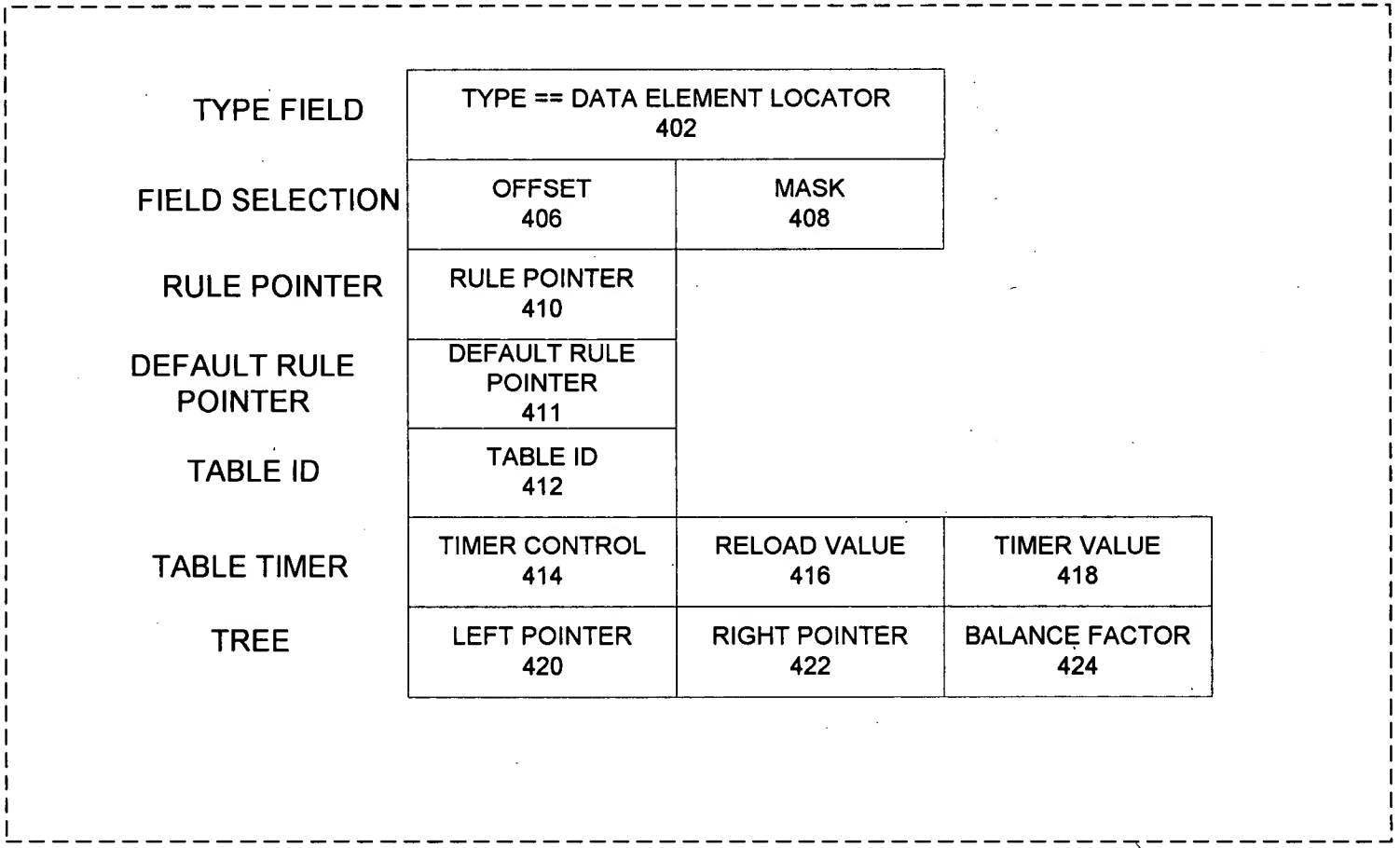


FIGURE 4
(DATA ELEMENT LOCATOR
STRUCTURE)

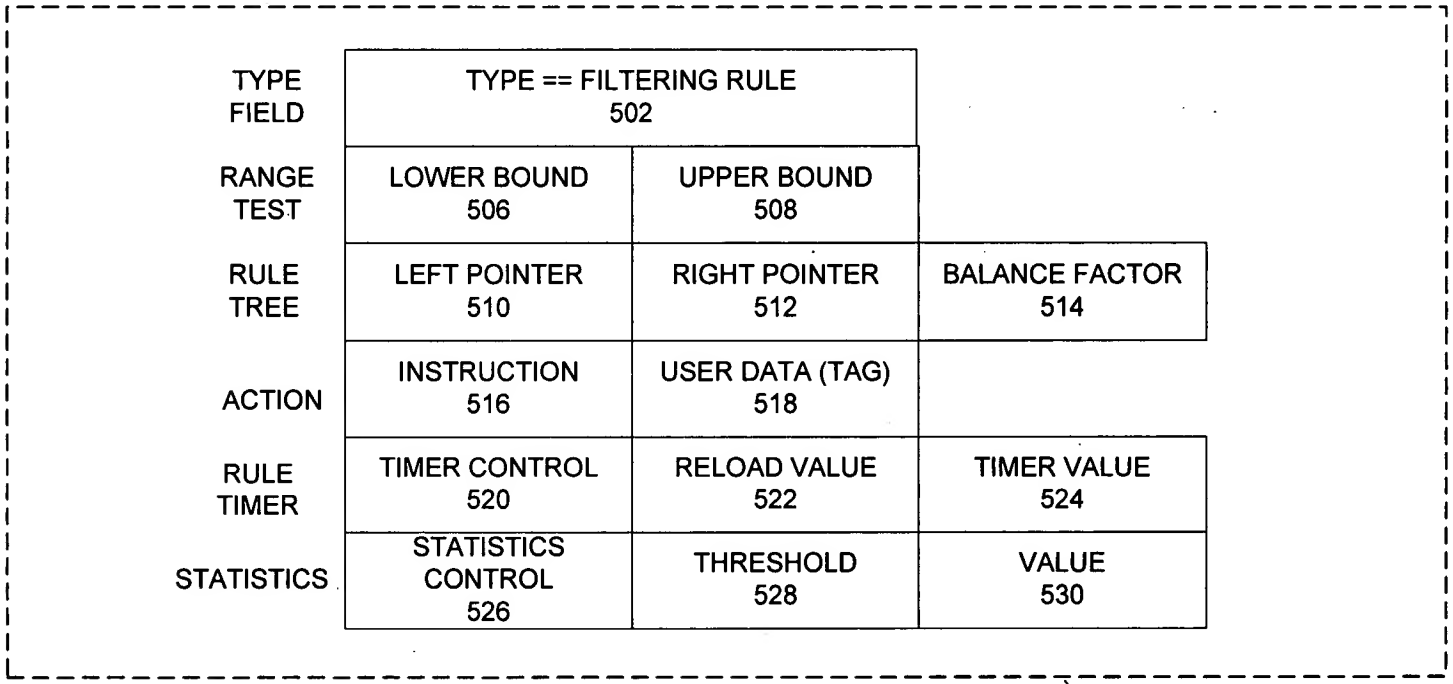


FIGURE 5A
(FILTERING RULE)

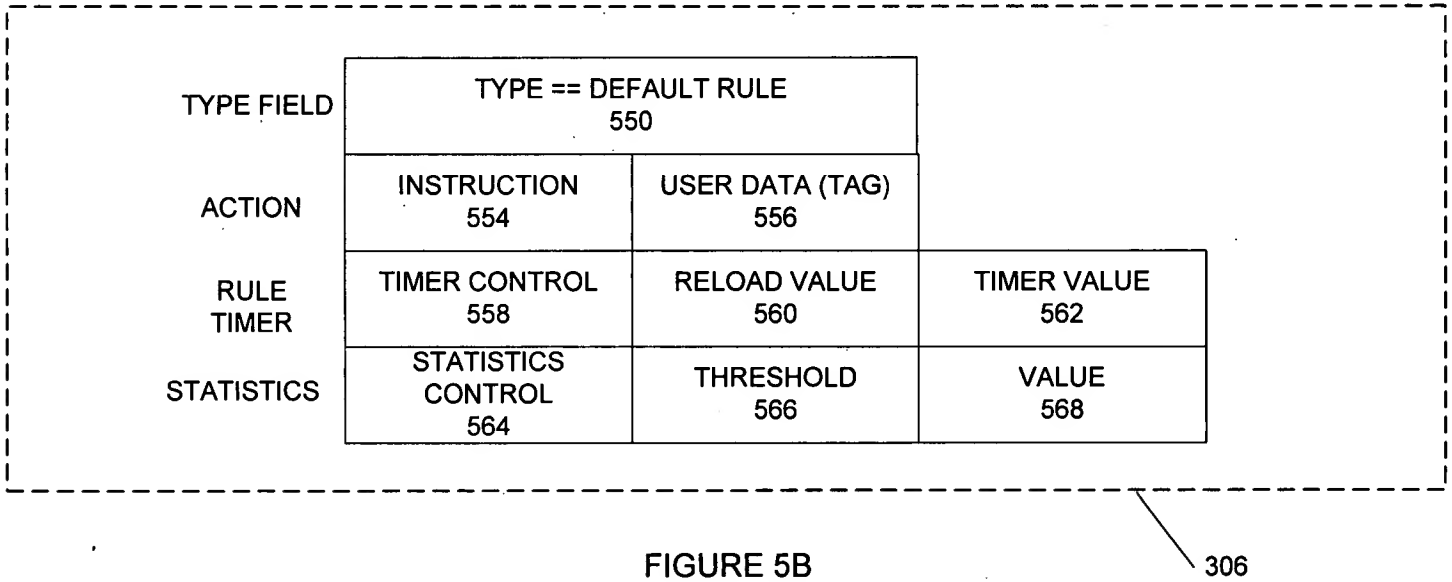


FIGURE 5B
DEFAULT RULE

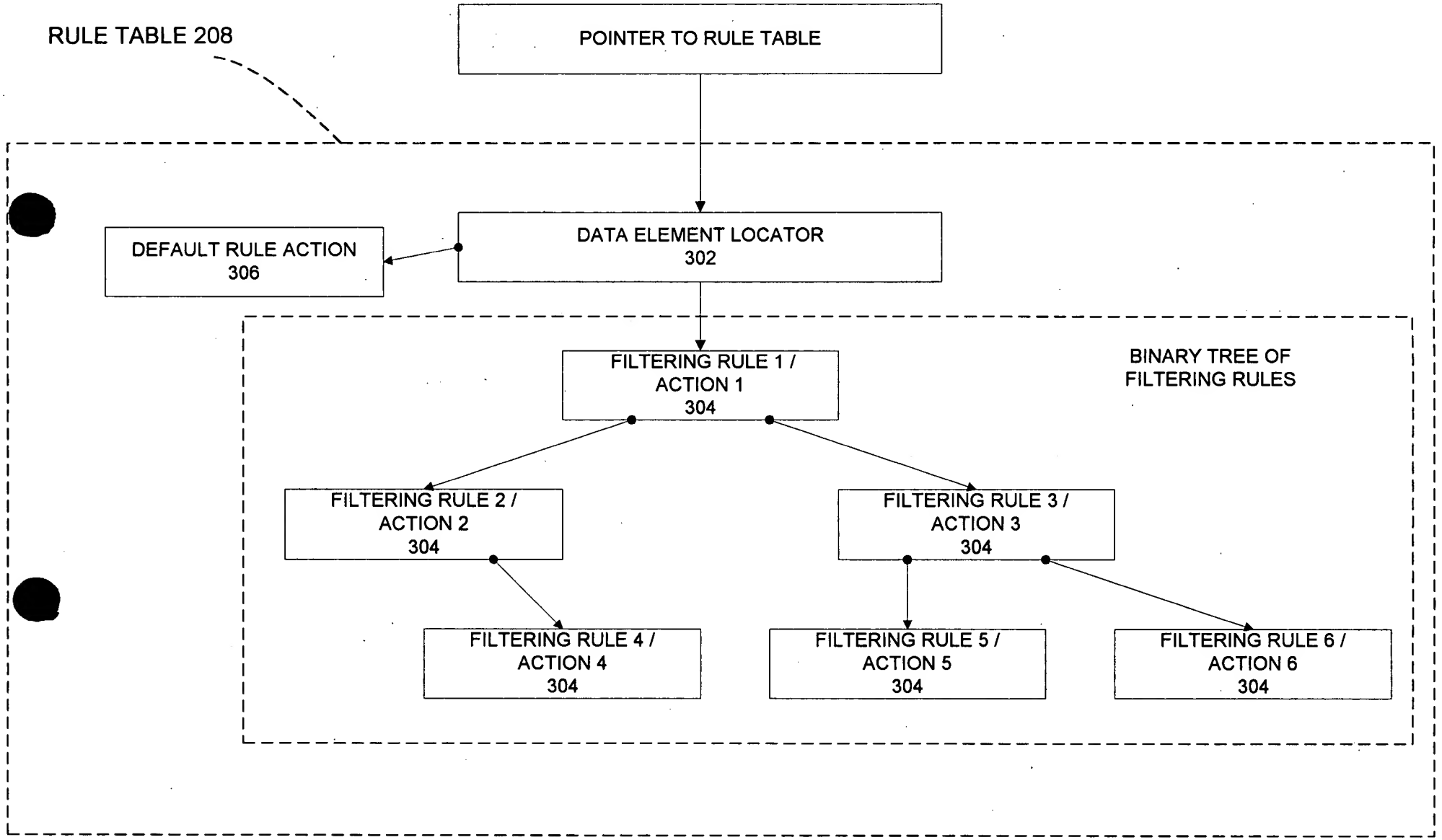


FIGURE 6
(RULE TABLE WITH A BINARY TREE OF FILTERING RULES)

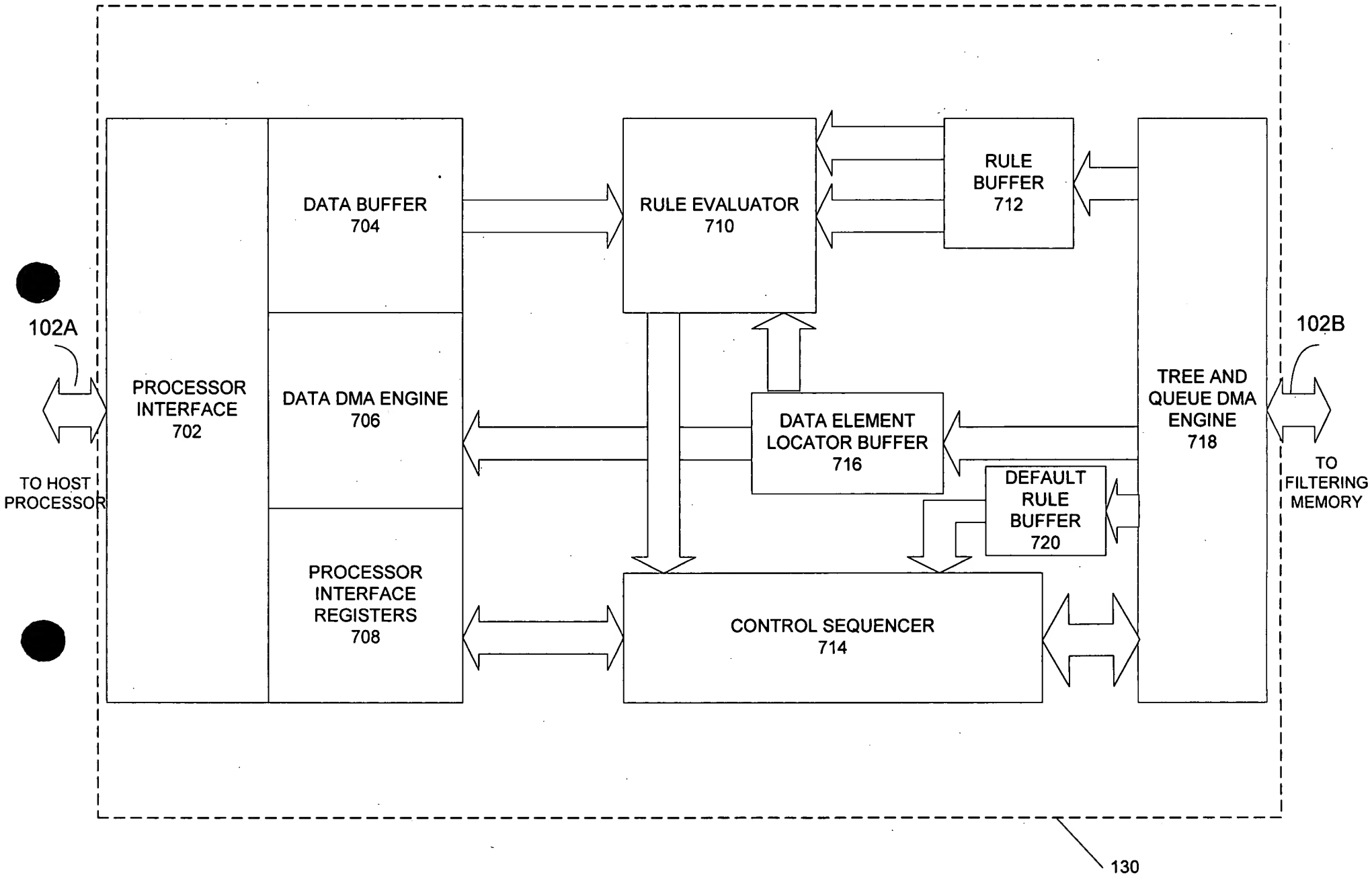


FIGURE 7
DATA FILTERING ENGINE

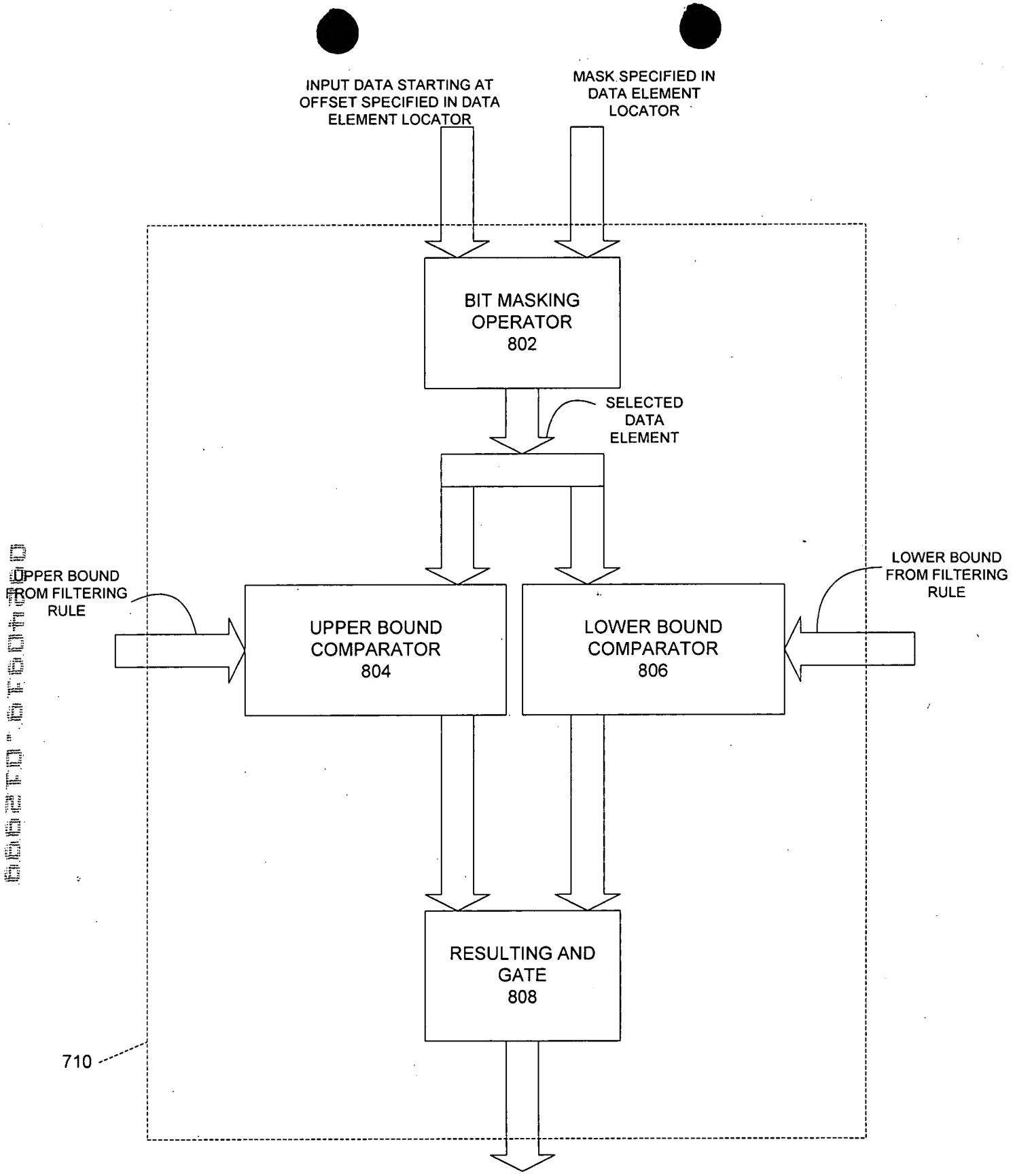
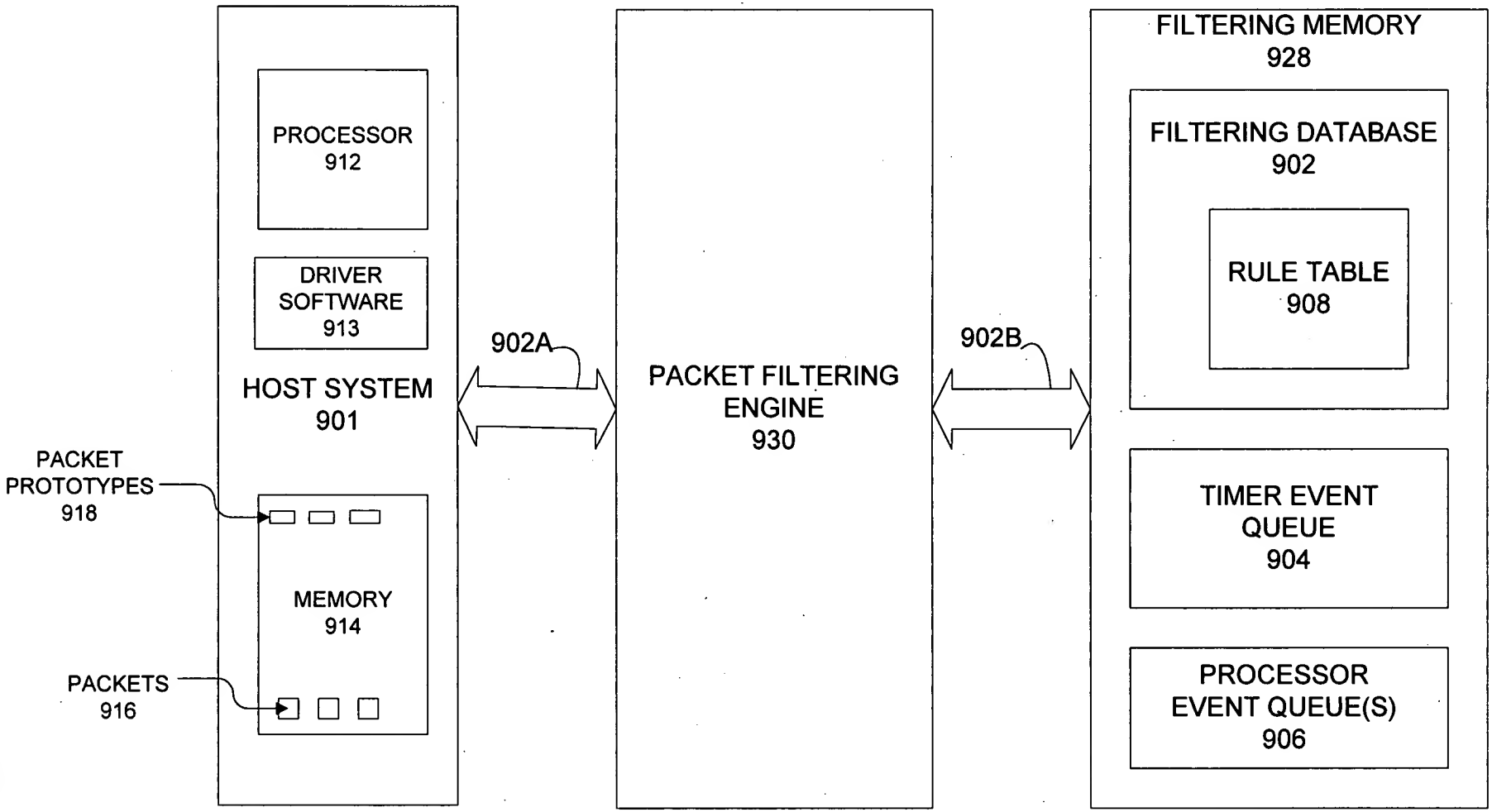


FIGURE 8
(RULE EVALUATOR 710)



900

FIGURE 9A

(SEQUENTIAL PACKET FILTERING SYSTEM)

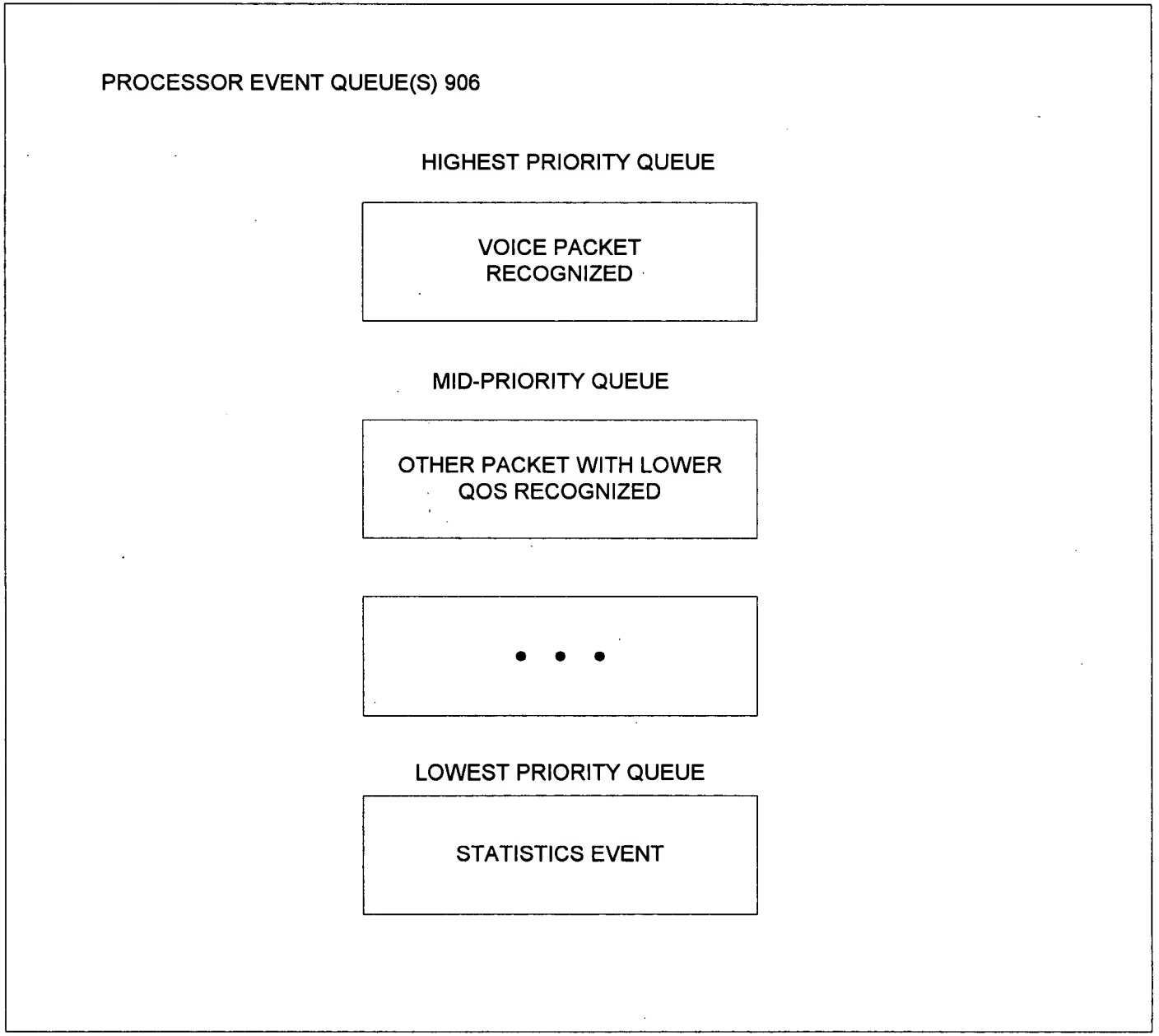


FIGURE 9B
APPLICATION OF MULTIPLE EVENT QUEUES

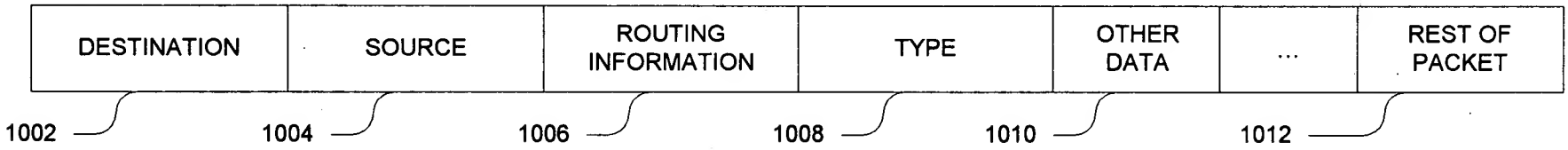


FIGURE 10
(PACKET FORMAT)

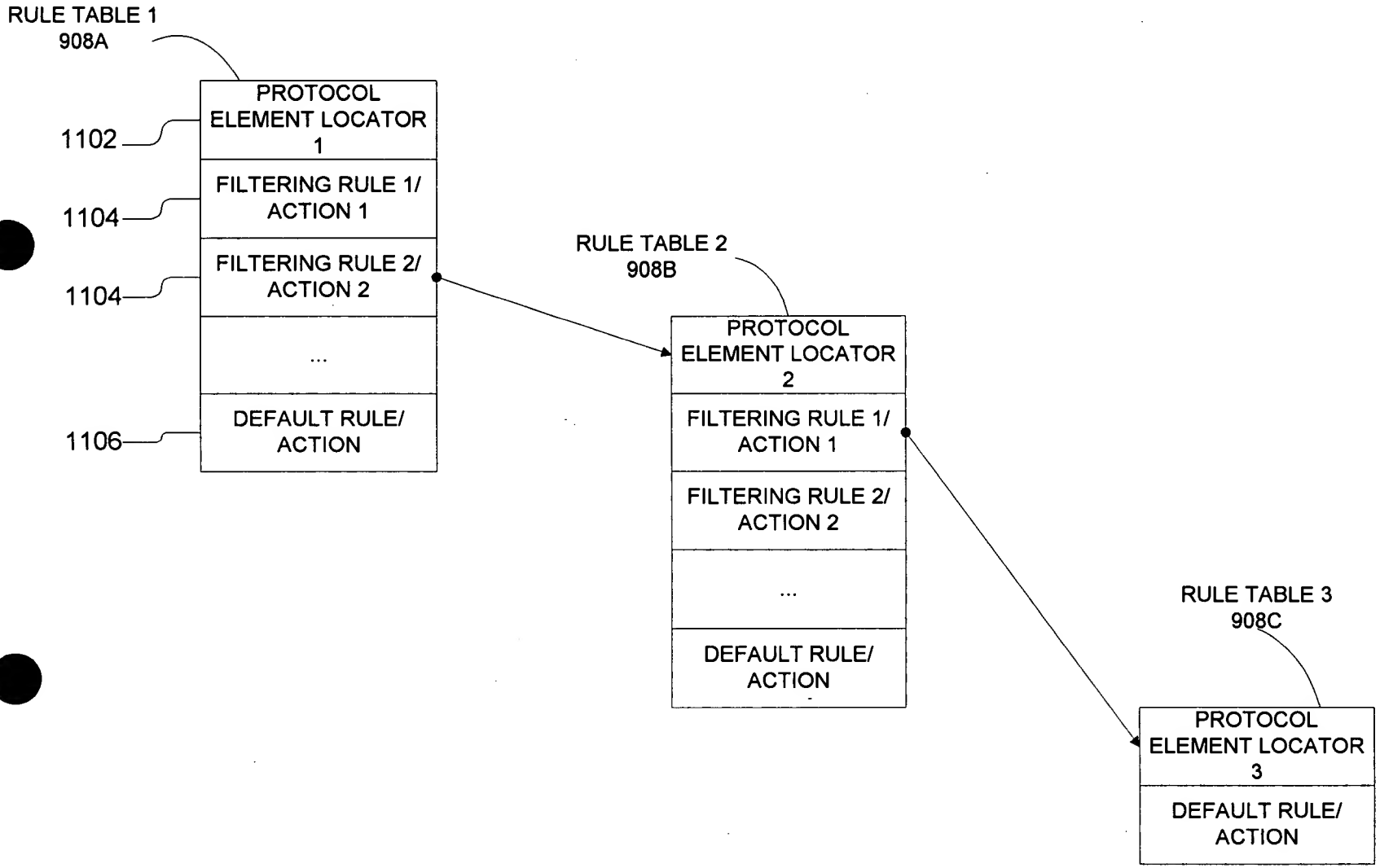


FIGURE 11

MULTI-WAY DECISION TREE AS LINKED RULE TABLES

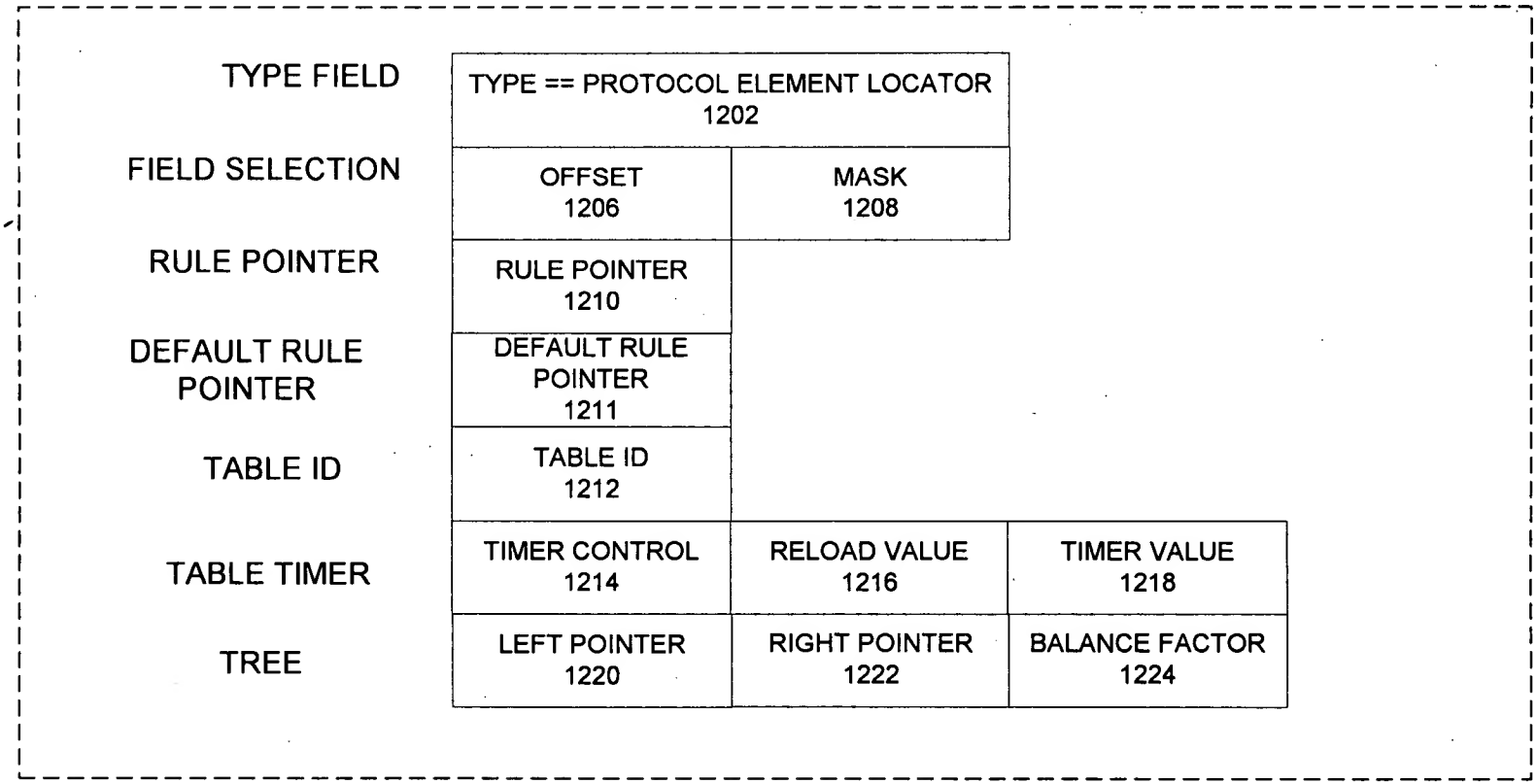
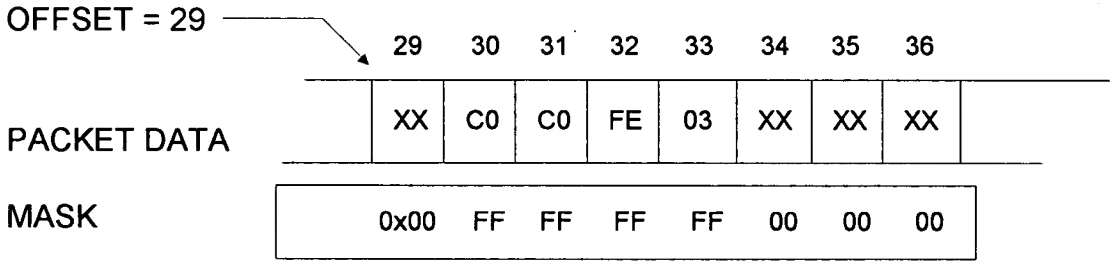


FIGURE 12A
(PROTOCOL ELEMENT LOCATOR STRUCTURE)



192.192.254.3 AN IP HOST ADDRESS

FIGURE 12B
(SELECTED PROTOCOL ELEMENT)

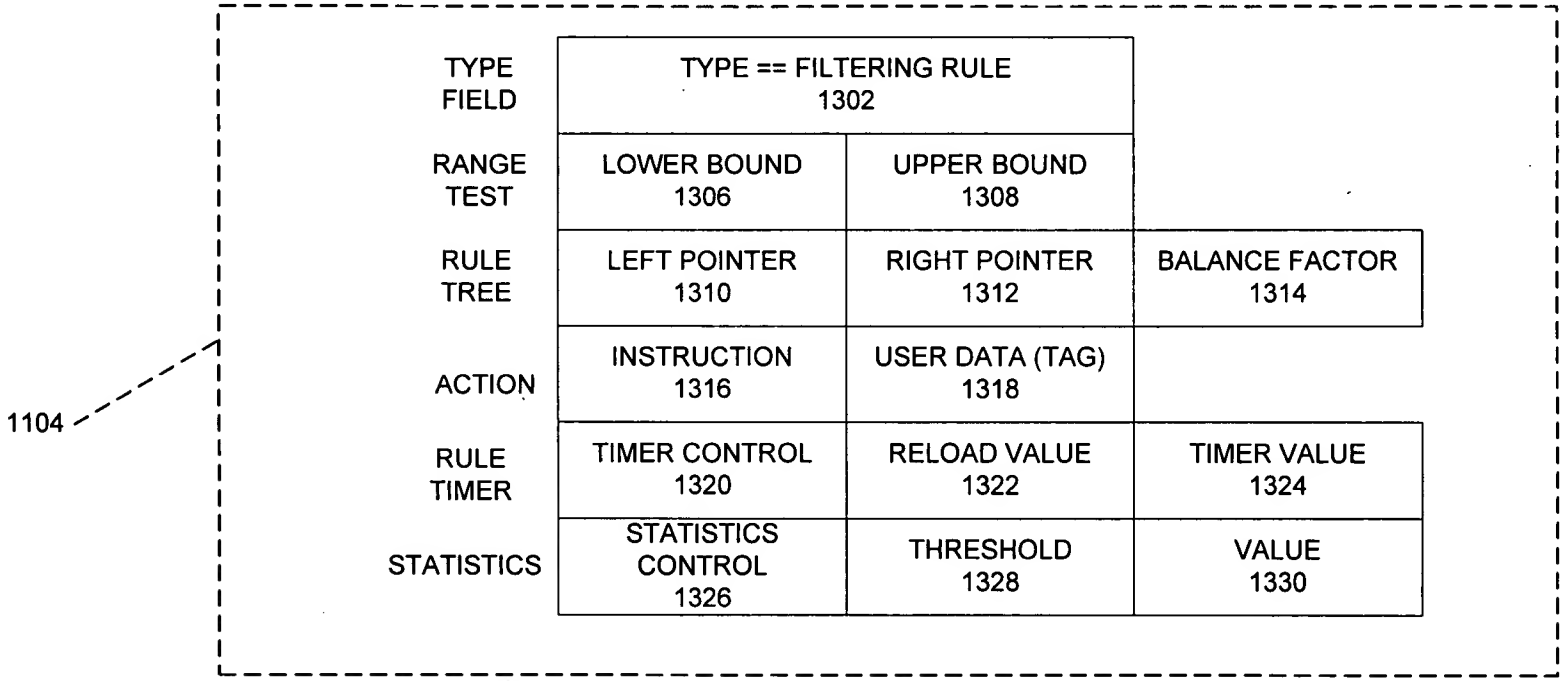


FIGURE 13A
(FILTERING RULE)

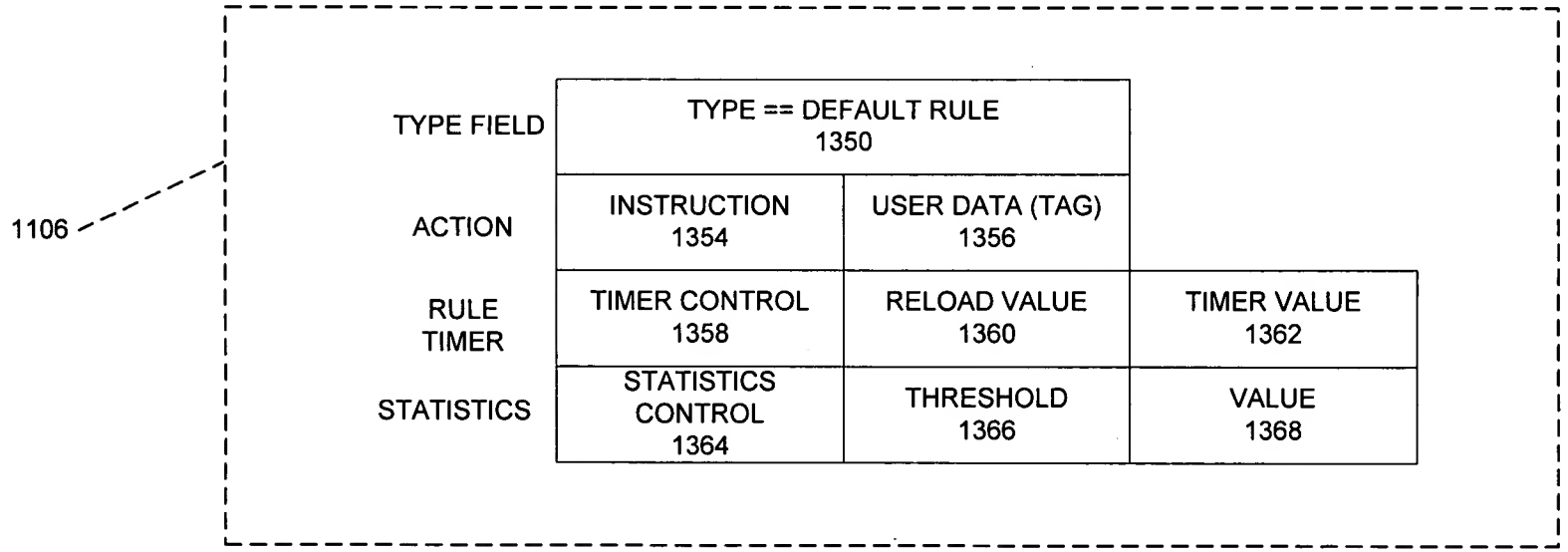


FIGURE 13B
(DEFAULT RULE)

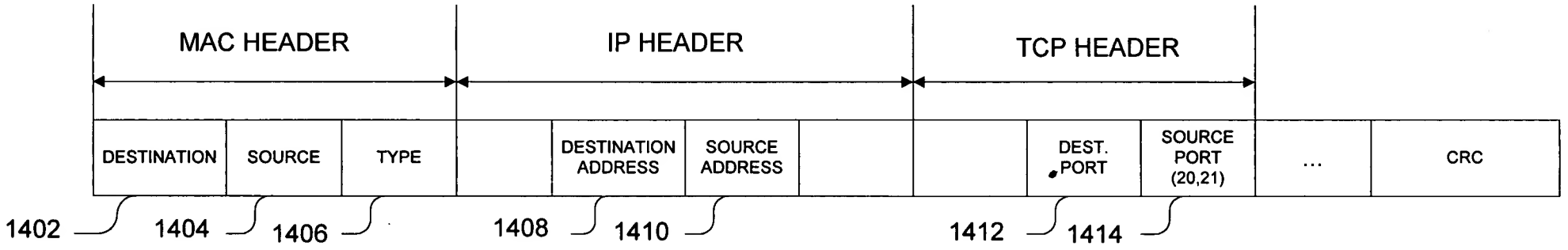


FIGURE 14A

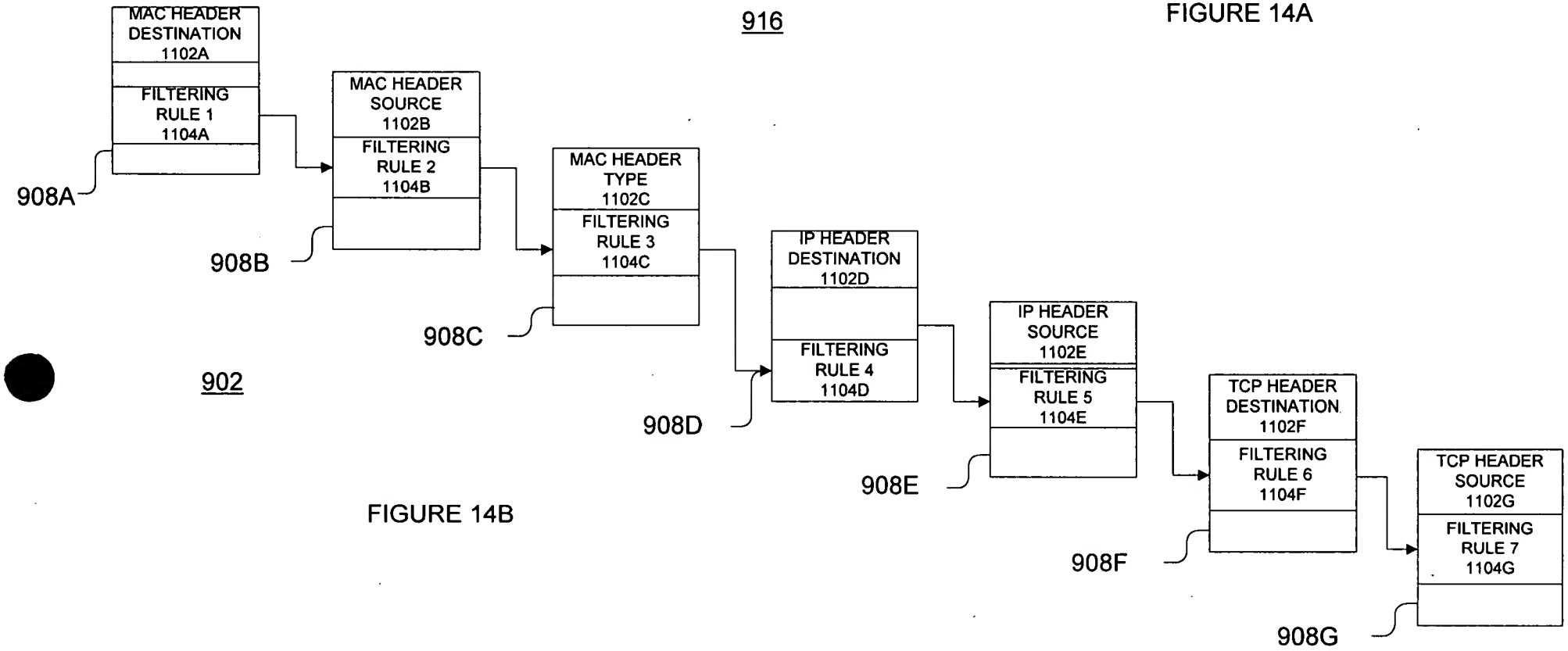


FIGURE 14B

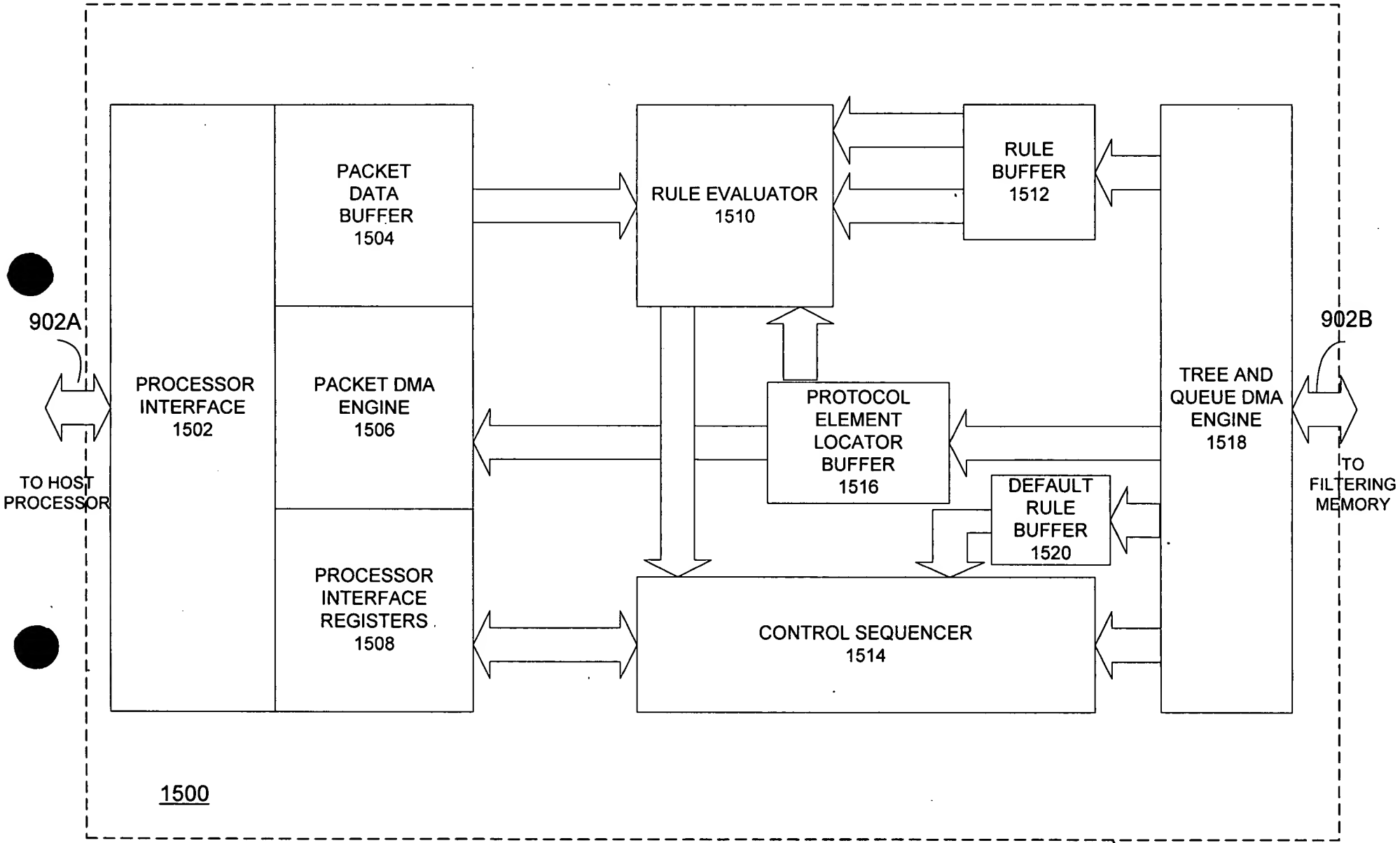


FIGURE 15
SEQUENTIAL PACKET FILTERING ENGINE

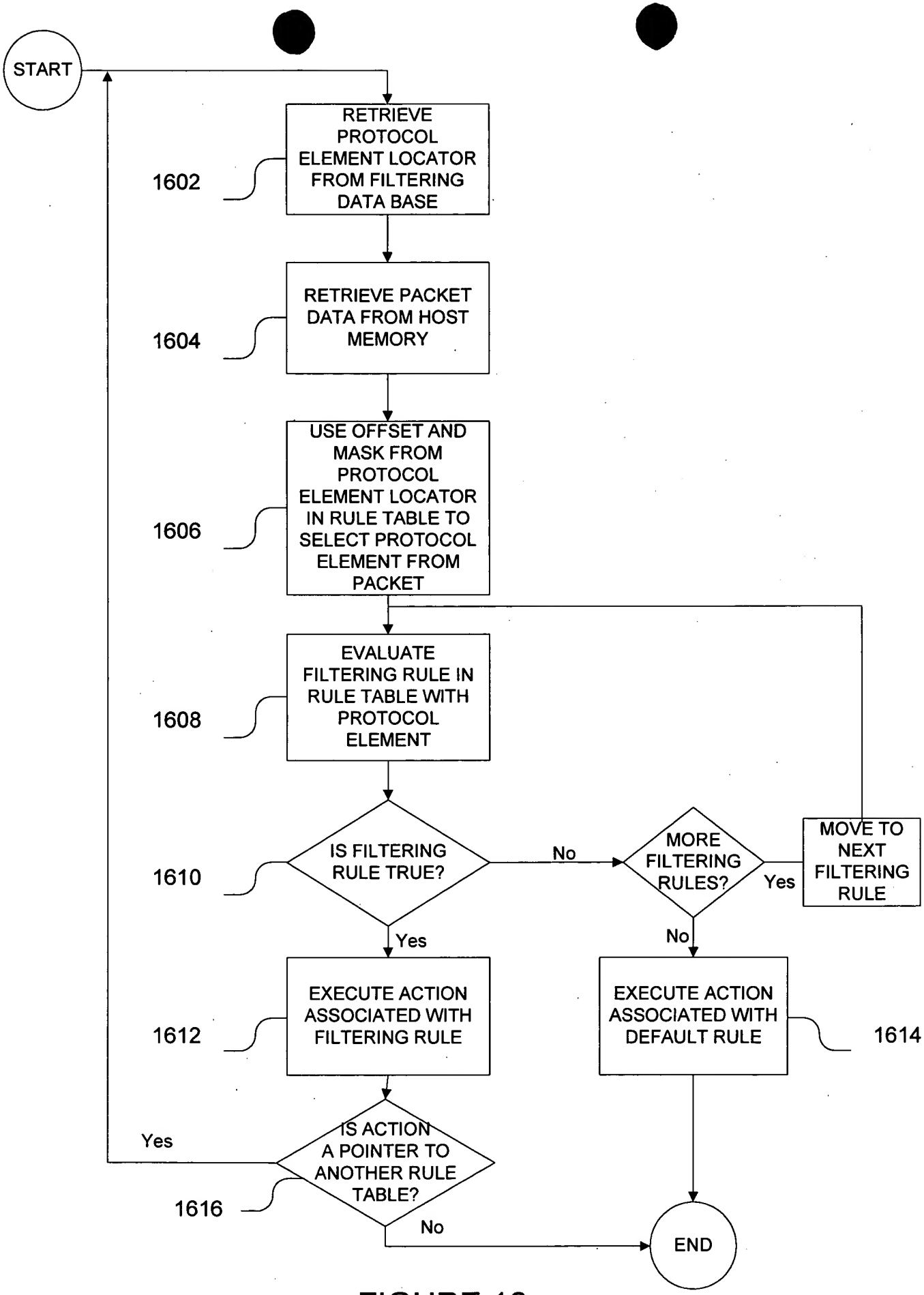

START
RETRIEVE PROTOCOL ELEMENT LOCATOR FROM FILTERING DATA BASE
1602
RETRIEVE PACKET DATA FROM HOST MEMORY
1604
USE OFFSET AND MASK FROM PROTOCOL ELEMENT LOCATOR IN RULE TABLE TO SELECT PROTOCOL ELEMENT FROM PACKET
1606
EVALUATE FILTERING RULE IN RULE TABLE WITH PROTOCOL ELEMENT
1608
IS FILTERING RULE TRUE?
1610
No
MORE FILTERING RULES?
Yes
MOVE TO NEXT FILTERING RULE
Yes
No
EXECUTE ACTION ASSOCIATED WITH FILTERING RULE
1612
EXECUTE ACTION ASSOCIATED WITH DEFAULT RULE
1614
Yes
IS ACTION A POINTER TO ANOTHER RULE TABLE?
1616
No
END

FIGURE 16

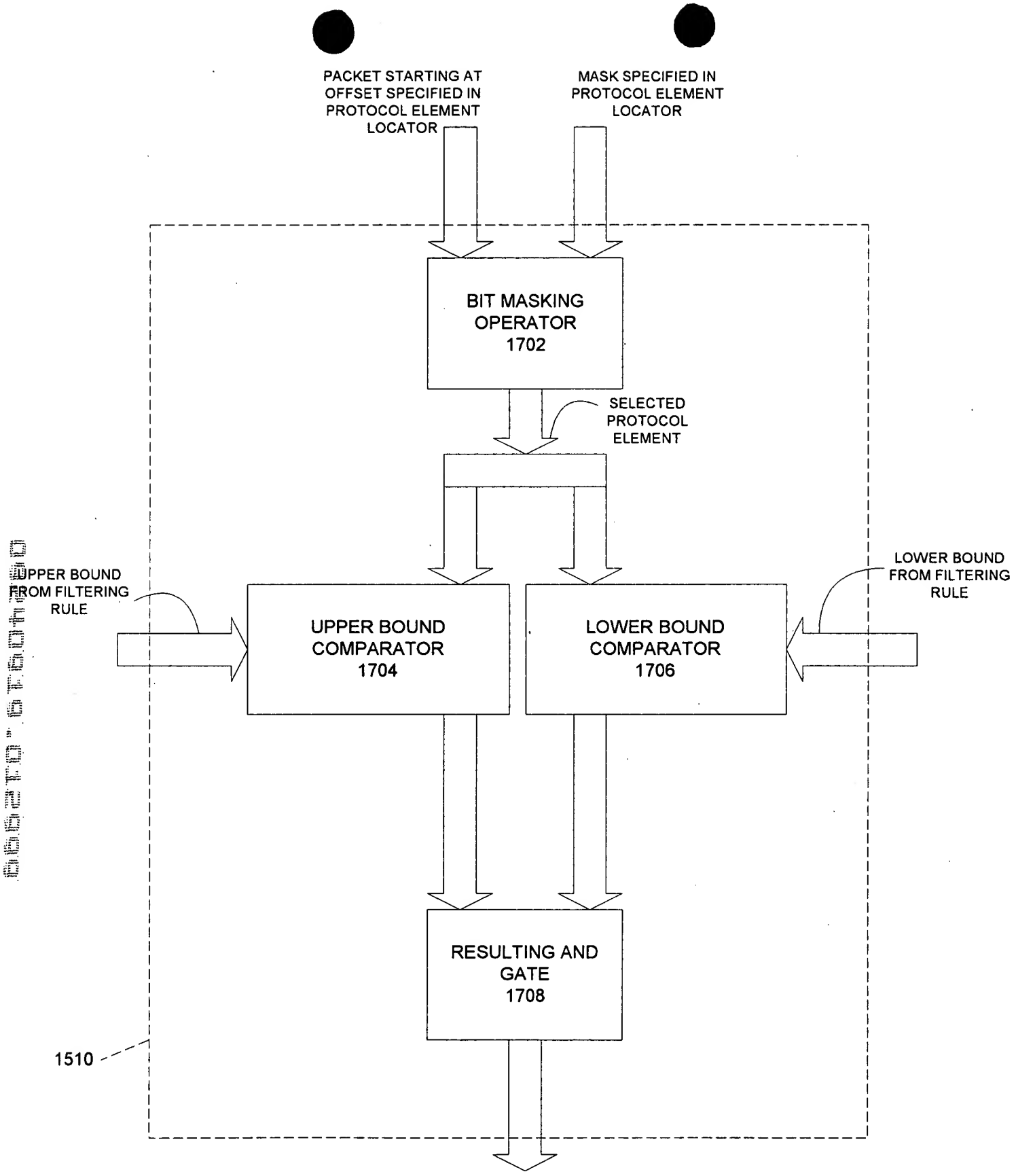


FIGURE 17
(RULE EVALUATOR)

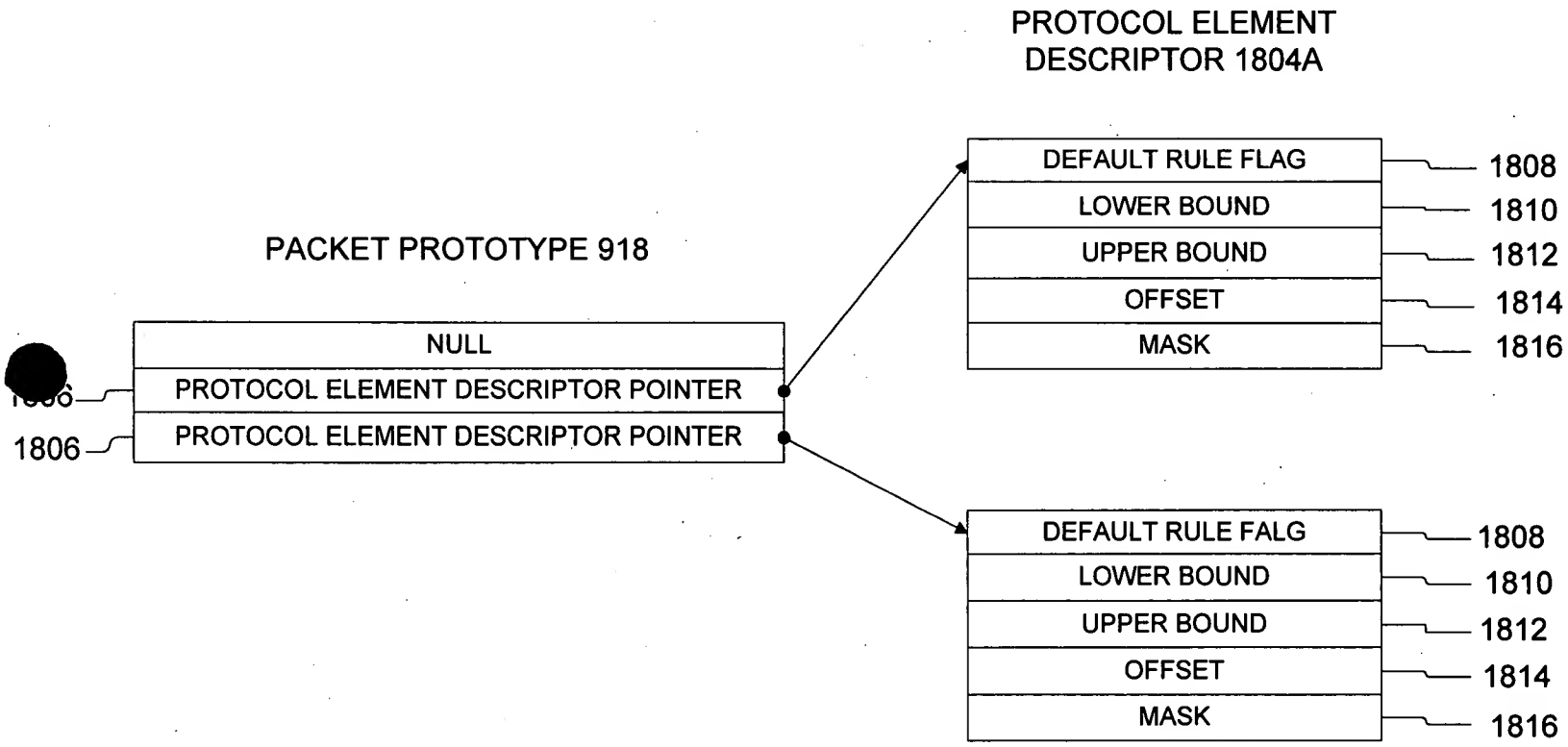


FIGURE 18

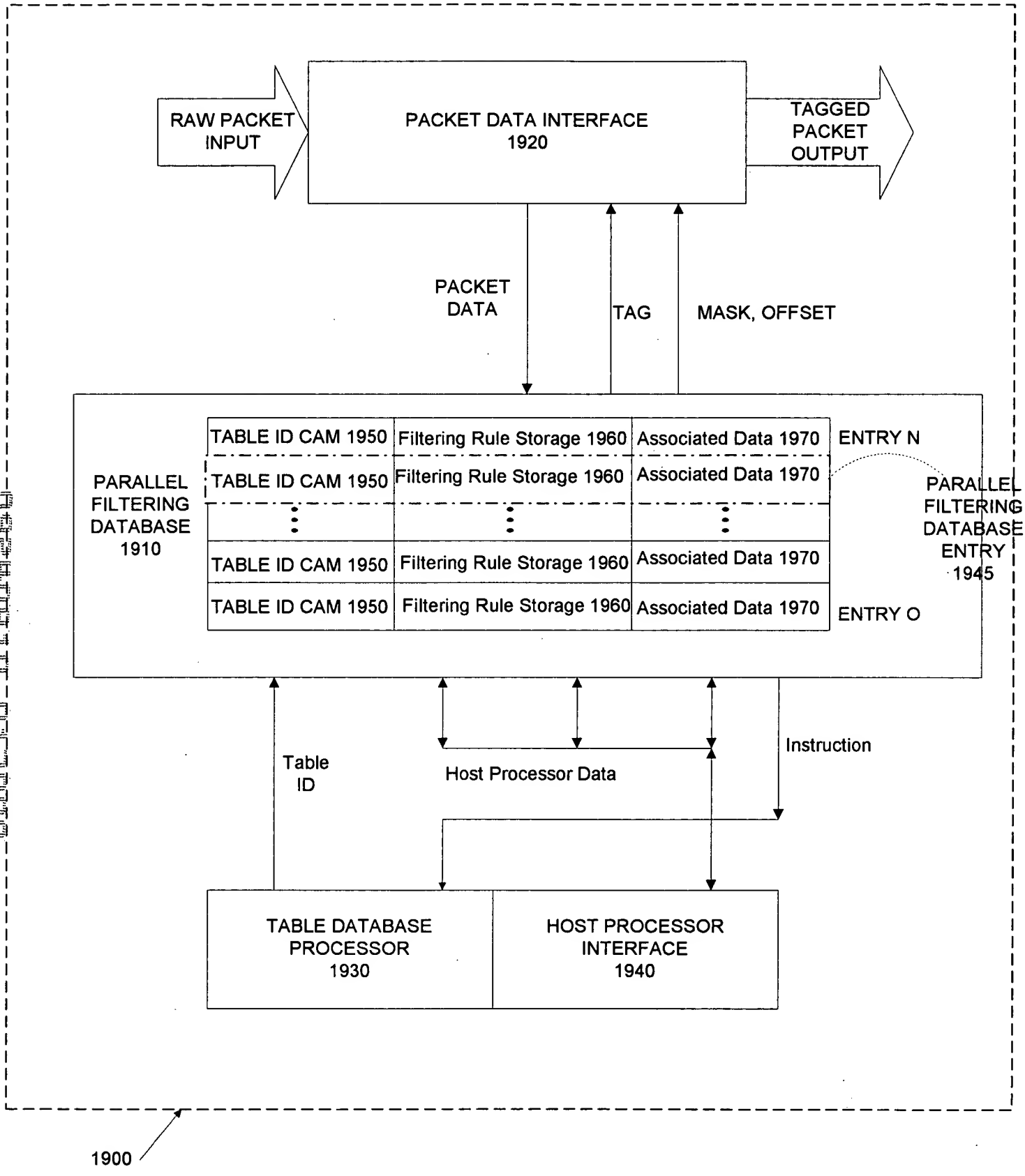


FIGURE 19
PARALLEL PACKET FILTERING SYSTEM

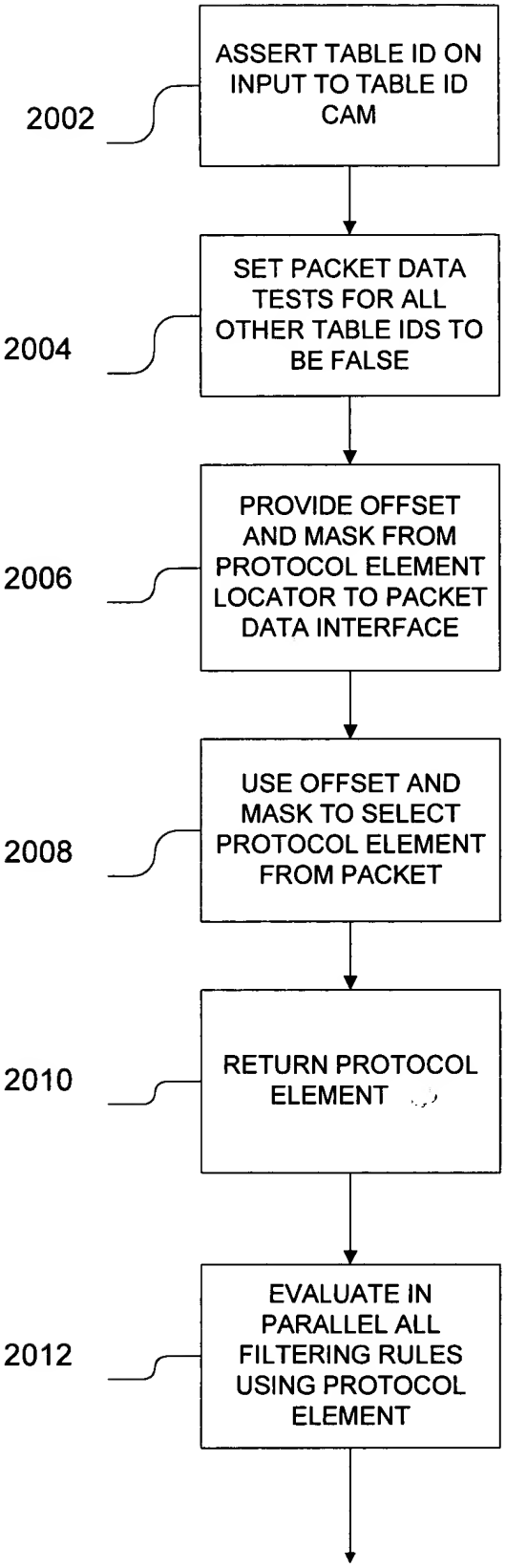

2002
ASSERT TABLE ID ON INPUT TO TABLE ID CAM
2004
SET PACKET DATA TESTS FOR ALL OTHER TABLE IDS TO BE FALSE
2006
PROVIDE OFFSET AND MASK FROM PROTOCOL ELEMENT LOCATOR TO PACKET DATA INTERFACE
2008
USE OFFSET AND MASK TO SELECT PROTOCOL ELEMENT FROM PACKET
2010
RETURN PROTOCOL ELEMENT
2012
EVALUATE IN PARALLEL ALL FILTERING RULES USING PROTOCOL ELEMENT

FIGURE 20A

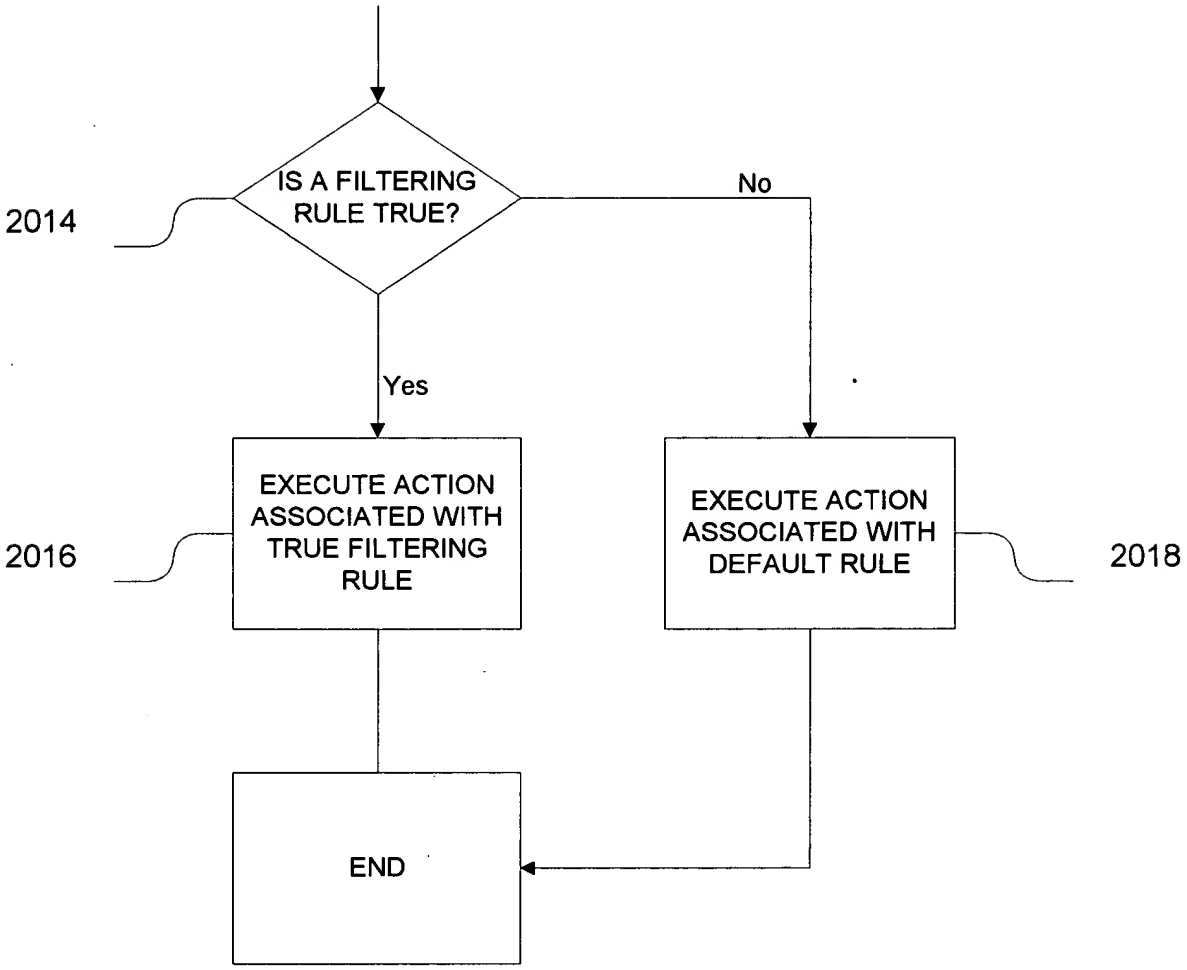

IS A FILTERING RULE TRUE?
2014
No
Yes
EXECUTE ACTION ASSOCIATED WITH TRUE FILTERING RULE
2016
EXECUTE ACTION ASSOCIATED WITH DEFAULT RULE
2018
END

FIGURE 20B